

## SMD wideband transformer for safe signal transmission – even in medical technology

A wide range of electronic devices are used for medical diagnoses. In many cases they are used in direct contact with the patient and doctor or therapist. In order to protect the people involved, extensive safety regulations are specified, in particular those set out in the IEC EN 60601 series of standards.

### IEC EN 60601 series of standards

The IEC EN 60601 series of standards defines safety requirements and ergonomic requirements on medical electrical equipment and in medical systems. The IEC EN 60601 family includes around 10 collateral standards (ISO EN 60601-1-xx). Each of these applies to a different sub-group in all medical products. Thus, for instance, IEC EN 60601-1-3 only applies to products which use X-rays for diagnostic purposes. Around 60 additional so-called particular standards (ISO EN 60601-2-xx) set out the specific safety requirements for individual types of medical equipment, such as for example IEC EN 60601-2-18 Medical electrical equipment - Part 2-18: Particular requirements for the basic safety and essential performance of endoscopic equipment.

### Modern medical diagnostics, for instance using video endoscopy

Technological advances mean that ever-more powerful applications are possible, including in the field of medical diagnostics. Various imaging techniques are in use. One of these is video endoscopy, in which a body cavity (e.g. the abdomen or a knee joint) or a hollow organ (e.g. the bowel or a lung) are examined internally using an endoscope. The endoscope essentially comprises a flexible rubber tube or metal pipe with a light source, lens and camera.



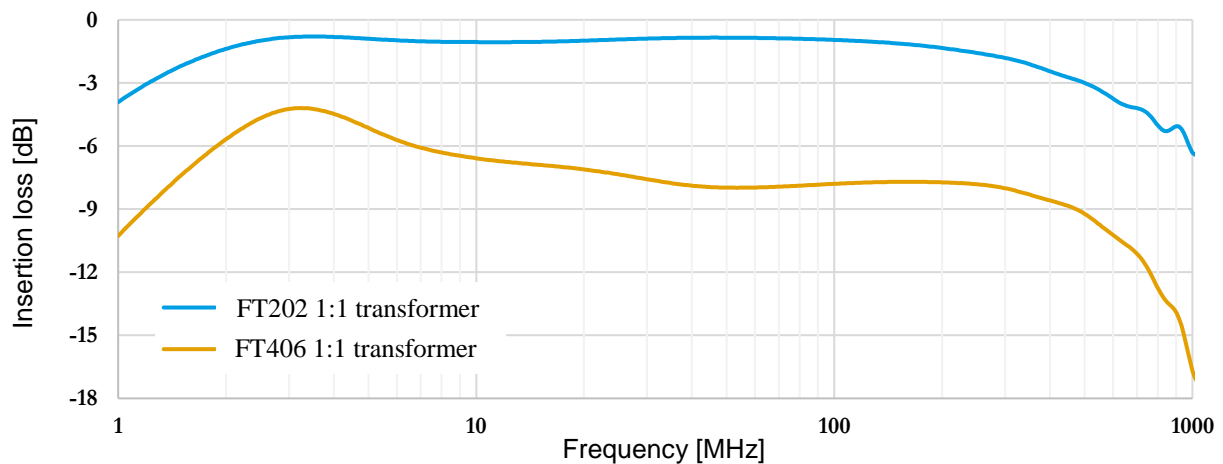
Medical endoscope

Video endoscopy provides high-resolution images, which are transmitted digitally in real time to the device which displays them, such as a monitor. This results in high data transfer rates and accordingly high transfer frequencies for the electrical signals. For various reasons, it is advantageous that the electronic components used are as small as possible, whereby lots of space is often required to implement the air and creepage distances.

## Small design and high bandwidth

NEOSID provides the solution for such combined requirements by deploying state of the art materials, and on the basis of the company's many years' experience developing and manufacturing small, specialised components. By determining special winding parameters and using components of the very latest generation, it is possible for example to realise a 1:1 signal transformer with galvanic isolation, which achieves remarkable operating frequency bandwidths and high transfer frequencies of up to over 1 GHz. Such a component enables data transfer rates in the GBit/s range, which in turn enables high digital signal transmission rates.

The insertion loss is as low as possible, reducing the loss of signal over the entire operating frequency range:



Transfer characteristics for wideband transformers SM-FT202 and SM-FT406

## Small design, great insulation protection

Our SM-FT202 transformer only occupies around half a square centimetre of space on the circuit board, and yet, thanks to its 5mm air and creepage distance and 2 kV dielectric strength, still achieves 2MOOP and 2MOPP classification in respect of secondary circuits, in accordance with the aforementioned standard.

Our SM-FT406 transformer is only a little bigger. Thanks to its increased insulation, 3 kV dielectric strength and 6 mm air and creepage distance, it offers maximum electrical safety for main-connected equipment.



In both designs, various winding configurations are possible, including customer-specific demands. The transmission ratio and number of windings can be adapted to meet customer requirements.

Technical LCP materials for precise applications are used for the housing. These possess good thermal and chemical resistance, as well as good mechanical properties. Thanks to

their flat surface, the components can be automatically assembled, and are reflow solderable.

The components are available with or without high frequency-compatible potting. Tailor-made designs can be realised for any application.

**SM-FT202 and SM-FT406 transformers: Technical data**

|  |   |   |
|--|---|---|
|  |  |  |
| Part name  | SM-FT202  | SM-FT406  |
| Dimensions (LxWxH)                               | 8.5 x 6.0 x 4.5 mm  | 10.8 x 8.8 x 5.5 mm   |
| Frequency range $f_B$                            | 1 MHz to > 1 GHz  | 1 MHz to > 500 GHz  |
| Power $P_{max}$                                  | 250 mW  | 500 mW  |
| Protective class in accordance with ISO EN 60601 | 2MOPP protection against secondary circuit  | Up to 2MOPP protection against mains  |

**Process technology**

Our manufacturing facilities work with the latest production machinery, thus ensuring cost-effective production for different batch sizes. A high manufacturing and testing depth result in an extremely high quality standard, with consistent results across the entire product life cycle.

**Tell us your requirements – we will develop the fitting solution for you!**

Have we aroused your interest? Then get in touch with us about the latest generation of high frequency transformers with high insulation requirements.

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